

*Observations of Stars Occulted by the Moon during the Eclipse of 1888, January 28, at the University Observatory, Oxford.*  
 Made under the direction of Professor C. Pritchard, D.D., F.R.S.

All due preparations were made for observing the occultations; but the state of the sky was so fitful, and in general so hazy, that very few phenomena could be observed at all, and of those that were attempted probably none is of any value—not even excepting No. 164, where the times of disappearance recorded by the two observers are identical, and the reappearance of No. 136, where the recorded times are fairly close.

Four photographs of the Moon, taken with a 15-inch mirror, were secured before totality, but they possessed the same abortive characteristics as those presented by the star occultations, and from the same causes.

The intention was to photograph the district containing the occultable stars, but up to the present time the sky has presented no favourable opportunity.

Phase	Immersion.						Emersion.					
Instrument	Grubb Refr.			De la Rue Refl.			Grubb Refr.			De la Rue Refl.		
Aperture	12½ inches.			13 inches.			12½ inches.			13 inches.		
Power	120			80			120			80		
Observer	Jenkins			Plummer			Jenkins			Plummer		
G.M.T.	h	m	s	h	m	s	h	m	s	h	m	s
No. 157*	10	31	48.3									
164	10	38	9.1	10	38	9.1						
180	...			10	50	20.5						
136	...			...			10	56	1.2	10	55	59.9
126	...			...			11	1	53.4	11	1	55.4
128	...			...			...			11	4	53.7
*	11	13	58.9									
198	...			11	15	39.6						
201	11	26	2.4	11	26	3.5						

*University Observatory, Oxford:*  
 1888, March 8.

\* Numbers as given in Dr. Döllén's list, dated Pulkova, Dec. 18, 1887.

*Total Eclipse of the Moon, 1888, January 28.*

By the Rev. S. J. Perry, D.Sc., F.R.S.

The long duration of this eclipse, and the pains taken by Professor Döllén in calculating the positions of the stars to be occulted at Stonyhurst during totality, made me give special attention to the preliminary observations for this eclipse. Some of the star places were recalculated by the Rev. W. Crofton, as Professor Struve in his circular to the observatories had requested that this should be done for greater security, and the results proved that the graphical method adopted by Professor Döllén was sufficiently accurate. A careful map was also drawn of all the stars to be occulted, and this was compared with the charts of Chacornac and Argelander in order to identify as many stars as possible beforehand. A  $5\frac{1}{2}$ -inch achromatic of Alvan Clark, which gives most perfect definition, was set apart for the occultations, and was supplemented by a 4-inch equatorial of Jones. The 8-inch instrument of Simms was reserved for a spectroscopic examination of the light of the eclipsed Moon, and the spectroscope used on this equatorial was so constructed by Hilger that one or two prisms of  $30^\circ$  can be used at will, six sets of prisms of aluminium, quartz, calcite, dense flint, white flint, and crown glass being adapted to the same mounting. A series of observations was made with the different prisms during the week that preceded the eclipse, measurements of the lines in the spectrum of the clouds and also of the lunar crescent were taken, and the spectroscope was found to work very satisfactorily. Two aluminium prisms gave altogether the best results, as the lunar spectrum was strong, and the fine lines distinct throughout. A single prism of aluminium glass, or of white flint, gave equally good definition, though the lines were somewhat clearer in the violet with the aluminium, and in the rest of the spectrum with the flint. The calcite was at least as good as either of the other prisms in the red, and was fair in the violet, but much inferior in the remainder of the spectrum. The dense flint and crown gave the lines less distinctly; but with one, or with two, quartz prisms the details were seen almost as well as with the aluminium. I am dwelling rather longer on these preliminary observations than might perhaps be deemed necessary, but I am doing so advisedly, as the trustworthiness of the results obtained during the eclipse must depend mainly on the fitness of the spectroscope for the object proposed.

Early on the evening of the eclipse the sky was all that could be desired, and the penumbra was very visible on the Moon at 8<sup>h</sup> 48<sup>m</sup>. A series of readings of the principal lines in the lunar spectrum was then taken, the two aluminium prisms being used, and giving a very extended spectrum. During these measures cirrus clouds were thickening, and a brilliant double halo formed round the Moon two orange rings, of about  $12^\circ$  and  $16^\circ$  in